Proposed City of San Diego Watershed Activities

for

San Diego Bay Watershed

The San Diego Bay Watershed Urban Runoff Management Plan is currently being prepared in collaboration with other jurisdictions, and drafts are not yet available. The following proposed City of San Diego watershed activities will be integrated into the final version of the San Diego Bay Watershed Urban Runoff Management Plan and represent the City of San Diego's commitment to and anticipated efforts in the San Diego Bay Watershed over the next five years. The final version of the plan will be submitted to the San Diego Regional Water Quality Control Board pursuant to requirements in the 2007 Municipal Permit (Order No. R9-2007-0001).

San Diego Bay Watershed Management Area
Five-Year Plan of Action Matrix

	Watershed HAs										Pollutant Categories										Activity Type				Implementation Schedule				
Jurisdiction	908.1	908.2	908.3	909.1	909.2	909.3	910.1	910.2	910.3	Activity	Bacteria*	Dissolved Minerals	Gross Pollutants*	Heavy Metals*	Nutrients	Oil & Grease	Organics	Pesticides*	Sediment	Trash	Monitoring	Source Investigation	Load Reduction	Education	Year 1 2007-2008	Year 2 2008-2009	Year 3 2009-2010	Year 4 2010-2011	Year 5 2011-2012
SD	X	X	X	X				X		ILACSD Trash Cleanup Sponsorship	X									X			X		I A	I A	I A	I A	I A
SD	X	X	X	X				X		SDCK Trash Cleanup Sponsorship	X									X			X		I A	I A	I A	I A	I A
SD		X								Alpha Project Trash Cleanups	X									X			X		I A				
SD		X								Chollas Creek WQ Protection & Habitat Enhancement Project	X	X	X	X	X	X	X	X	X		X		X	X	I M				
SD		X								Chollas Creek Watershed Aggressive Street Sweeping				X						X	X		X		P M I	M I	M I	A	
SD		X								Targeted Municipal Facility Inspections	X			X	X							X	X	X	P M I	M I	M I		
SD		X								Targeted Auto-Related Facility Inspections				X								X	X	X	P I A				
SD		X								Targeted Metals-Related Industrial Facility Inspections				X								X	X	X	P I A				
SD	X	X	X	X				X		Targeted Restaurant Facility Inspections	X											X	X	X	P I A				
SD	X	X	X	X				X		Targeted Residential Activity Inspections	X			X	X	X		X				X	X	X			P	P I A	P I A
SD		X								Dalbergia "Green Mall" Infiltration Retrofit	X			X							X		X	X	P M	P	PI	I A	A
SD		X								Memorial Park "Green Lot" Infiltration Retrofit	X			X							X		X	X	P	P	P M I	I A	A
SD	X	X	X	X				X		Municipal Rain Barrel Installation	X				X	X		X	X				X		P I	A			
SD		X								Trash Segregation BMP Installation	X									X	X		X		P	P	P M I	A	
SD		X								Inlet Bacteria Treatment BMP Installation	X									X	X		X		P	P	P M I	A	
SD		X								Infiltration BMP	X			X							X		X	X	P	P	P M	P I A	A

SD	X	X	X	X		X	X	Karma/Karma Second Chance Public Service Announcements	X		X							X					X	I	I A	I A	I A	I A
SD	X	X	X	X		X	X	Business and Residential CBSM Pilots	X		X	X						X			X	X	P	P I A	I A	I A	I A
SD	X	X	X	X		X	X	Billboards/Transit Shelters (General; Bacteria)	X									X				X	I A	I A	I A	I A	I A
SD	X	X	X	X		X	X	Mobile Advertising (General; Bacteria)	X		X	X		X		X	X	X				X	I A	I A	I A	I A	I A

* High Priority Pollutants

Planning (P)
Monitoring (M)
Implementation (I)
Assessment (A)

TITLE: **I Love A Clean San Diego Trash Cleanup Sponsorship**
ID NUMBER: **XXX**

ACTIVITY DESCRIPTION

Each spring, I Love A Clean San Diego (ILACSD) conducts its Creek to Bay Cleanup event to target various inland and coastal sites in San Diego County in need of trash and debris removal. ILACSD recruits and organizes site captains and groups of volunteers for each site. A media center is also designated, which promotes environmental stewardship, including the importance of keeping litter and debris from spoiling the region's watersheds. The whole event is marketed throughout San Diego County through a variety of media, including television, radio public service announcements, newspapers, newsletters, electronic mail, bulletin boards, community outreach activities, calendar listings, and word of mouth.

TMDL APPLICABILITY

- San Diego Region Beaches and Creeks Bacteria TMDL

TIME SCHEDULE FOR IMPLEMENTATION

Creek to Bay Cleanup has historically been held in April of each year. Prior to that month, the City will coordinate with ILACSD staff to ensure that sites within the San Diego Bay Watershed are included in the list for cleanups and that proper sponsorship arrangements are made.

PARTICIPATING WATERSHED COPERMITTEE(S)

- City of San Diego

OTHER PARTICIPATING ENTITIES

- ILACSD
- Volunteers from general public

HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED

- Bacteria

CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY

The Collective Watershed Strategy for the San Diego Bay WMA identifies bacteria as a high priority water quality problem throughout the WMA and recommends implementing load reduction/source abatement activities to address it. Sponsorship of Creek to Bay will result in load reduction of trash and debris directly and of bacteria indirectly.

EXPECTED BENEFITS

Although Creek to Bay Cleanup is focused on debris removal, it also addresses bacteria indirectly by removing a bacterial source: trash. Literature published by the United States Environmental Protection Agency on its website[1] states that debris may be contaminated by pathogens that have adverse effects on humans. By reducing the amount of trash and debris in the San Diego Bay WMA through cleanup events, bacteria loading is reduced.

[1] http://www.epa.gov/owow/oceans/debris/

EFFECTIVENESS MEASUREMENTS

Management Questions:	• What is the load reduction associated with sponsorship? • What is the efficiency of trash cleanup? ($/person or $/ton collected)
Targeted Measurable Outcome(s)	• Achieve load reduction of trash (any amount) due to trash cleanup sponsorship
Assessment Method(s)	• Tabulation (e.g., number of participants) • Quantification (e.g., pounds of trash collected)
Assessment Measures, Assessment Outcome Levels & Data:	• Money spent (USD) (Outcome Level 1 and 2) • Tons of trash (Outcome Level 4) • Number of participants (Outcome Level 1) • Compliance (yes/no) (Outcome Level 1)

TITLE: **San Diego Coastkeeper Trash Cleanup Sponsorship**
ID NUMBER: **XXX**

ACTIVITY DESCRIPTION

Each fall, San Diego Coastkeeper conducts the Coastal Cleanup Day event to target various inland and coastal sites in San Diego County in need of trash and debris removal. Coastkeeper recruits and organizes site captains and groups of volunteers for each site. A media center is also designated, which promotes environmental stewardship, including the importance of keeping litter and debris from spoiling the region's watersheds. The whole event is marketed throughout San Diego County through a variety of media, including television, radio public service announcements, newspapers, newsletters, electronic mail, bulletin boards, community outreach activities, calendar listings, and word of mouth.

TMDL APPLICABILITY

- San Diego Region Beaches and Creeks Bacteria TMDL

TIME SCHEDULE FOR IMPLEMENTATION

Coastal Cleanup Day has historically been held in September of each year. Prior to that month, the City will coordinate with Coastkeeper staff to ensure that sites within the San Diego Bay Watershed are included in the list for cleanups and that proper sponsorship arrangements are made.

PARTICIPATING WATERSHED COPERMITTEE(S)

- City of San Diego

OTHER PARTICIPATING ENTITIES

- San Diego Coastkeeper
- I Love A Clean San Diego
- Volunteers from general public

HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED

- Bacteria

CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY

The Collective Watershed Strategy for the San Diego Bay WMA identifies bacteria as a high priority water quality problem throughout the WMA and recommends implementing load reduction/source abatement activities to address it. Sponsorship of Coastal Cleanup Day will result in load reduction of trash and debris directly and of bacteria indirectly.

EXPECTED BENEFITS

Although Coastal Cleanup Day is focused on debris removal, it also addresses bacteria indirectly by removing a bacterial source: trash. Literature published by the United States Environmental Protection Agency on its website[1] states that debris may be contaminated by pathogens that have

[1] http://www.epa.gov/owow/oceans/debris/

adverse effects on humans. By reducing the amount of trash and debris in the San Diego Bay WMA through cleanup events, bacteria loading is reduced.

EFFECTIVENESS MEASUREMENTS

Management Questions:	• What is the load reduction associated with sponsorship? • What is the efficiency of trash cleanup? ($/person or $/ton collected)
Targeted Measurable Outcome(s)	• Achieve load reduction of trash (any amount) due to trash cleanup sponsorship
Assessment Method(s)	• Tabulation (e.g., number of participants) • Quantification (e.g., pounds of trash collected)
Assessment Measures, Assessment Outcome Levels & Data:	• Money spent (USD) (Outcome Level 1 and 2) • Tons of trash (Outcome Level 4) • Number of participants (Outcome Level 1) • Compliance (yes/no) (Outcome Level 1)

TITLE: **Alpha Project for the Homeless, Inc. Trash Cleanups**
ID NUMBER: **XXX**

ACTIVITY DESCRIPTION

The City's Storm Water Pollution Prevention Division has partnered with Alpha Project for the Homeless, Inc., through a Memorandum of Understanding to conduct trash and debris cleanups and potentially homeless encampment removals throughout the City's jurisdiction in various watersheds in FY 2007 and FY 2008.

TMDL APPLICABILITY

- San Diego Region Beaches and Creeks Bacteria TMDL

TIME SCHEDULE FOR IMPLEMENTATION

The City will coordinate with Alpha Project to ensure that sites within the San Diego Bay Watershed are included in the list of sites to target for cleanups in FY 2008.

PARTICIPATING WATERSHED COPERMITTEE(S)

- City of San Diego

OTHER PARTICIPATING ENTITIES

- Alpha Project for the Homeless, Inc.

HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED

- Bacteria

CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY

The Collective Watershed Strategy for the San Diego Bay WMA identifies bacteria as a high priority water quality problem throughout the WMA and recommends implementing load reduction/source abatement activities to address it. Cleanups by Alpha Project will result in load reduction of trash and debris directly and of bacteria indirectly.

EXPECTED BENEFITS

Although the cleanups conducted by Alpha Project focus on debris removal, it also addresses bacteria indirectly by removing a bacterial source: trash. Literature published by the United States Environmental Protection Agency on its website[1] states that debris may be contaminated by pathogens that have adverse effects on humans. By reducing the amount of trash and debris in the San Diego Bay WMA through cleanup events, bacteria loading is reduced.

EFFECTIVENESS MEASUREMENTS

Management Questions:	• What is the load reduction associated with sponsorship? • What is the efficiency of trash cleanup? ($/person or $/ton collected)
Targeted Measurable Outcome(s)	• Achieve load reduction of trash (any amount) due to trash cleanup sponsorship

[1] http://www.epa.gov/owow/oceans/debris/

Assessment Method(s)	• Tabulation (e.g., number of participants) • Quantification (e.g., pounds of trash collected)
Assessment Measures, Assessment Outcome Levels & Data:	• Money spent (USD) (Outcome Level 1 and 2) • Tons of trash (Outcome Level 4) • Number of participants (Outcome Level 1) • Compliance (yes/no) (Outcome Level 1)

TITLE: **Chollas Creek Water Quality Protection & Habitat Enhancement Project**

ID NUMBER: **XXX**

ACTIVITY DESCRIPTION

The City's Storm Water Pollution Prevention Division is managing the design and construction of a creek restoration project in Chollas Creek funded by a $2.244 million Proposition 13 grant from the State Water Resources Control Board. The project, titled *Chollas Creek Water Quality Protection & Habitat Enhancement Project*, will remove approximately 4,600 square feet of concrete and other hardscape in and adjacent to Chollas Creek and restore approximately 1.7 acres of native upland and riparian habitat along a 750 foot-long segment of the Encanto Branch of Chollas Creek. The project includes an approximately $500,000 education and outreach component to eliminate polluting practices of residents and businesses in the community.

TMDL APPLICABILITY

- San Diego Region Beaches and Creeks Bacteria TMDL
- Chollas Creek Dissolved Metals TMDL

TIME SCHEDULE FOR IMPLEMENTATION

The City anticipates construction to start in September 2007 and terminate in November 2007. Water quality monitoring will be conducted afterwards to assess effectiveness in removing pollutants from Chollas Creek.

PARTICIPATING WATERSHED COPERMITTEE(S)

- City of San Diego
- City of La Mesa

OTHER PARTICIPATING ENTITIES

- State of California
- San Diego Coastkeeper
- Community members

HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED

- Bacteria
- Metals

CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY

The Collective Watershed Strategy for the San Diego Bay WMA identifies bacteria and metals as high priority water quality problems in the Pueblo Watershed (more specifically Hydrologic Area 908.2) and recommends implementing load reduction/source abatement activities to address them. This creek restoration project will help treat runoff of bacteria, metals, and other pollutants.

EXPECTED BENEFITS

The project contributes to the implementation of the City's Chollas Creek Enhancement Program, a watershed-based planning effort to restore the natural functions and beneficial uses of

Chollas Creek and create a linear park for the community. By removing concretized portions, widening the bed to reduce scour and flow velocities, and re-vegetating with native plants, the restoration effort would improve the bio-filtration processes (i.e., filtering and removing pollutants from flows by plant uptake and natural filtration through soils) in the creek. The project will also create a linear park for the community so that the creek becomes a natural asset for the community to protect and not pollute.

In addition, knowledge and experience gained through this project will help the City document the benefits, limitations, and challenges of creek restoration as an urban runoff pollution control to meet Municipal Permit and TMDL requirements.

EFFECTIVENESS MEASUREMENTS

Management Questions:	• Does education help reduce pollutant loads from urban runoff? • What is the efficiency of pollutant load reductions with targeted educational programs in the Chollas Creek watershed? • Does habitat enhancement help reduce pollutant loads to San Diego Bay?
Targeted Measurable Outcome(s)	• Achieve load reduction from optimized habitat enhancement • Reach a set percentage of target resident population
Assessment Method(s)	• Tabulation (e.g., dollars spent on education, dollars spent to implement habitat enhancement) • Monitoring (e.g., concentration of COCs, flow in creek, used to compare upstream/downstream loads) • Quantification (e.g, calculation of load upstream/downstream of enhancement) • Survey (e.g., knowledge of residents pre/post education outreach)
Assessment Measures, Assessment Outcome Levels & Data:	• Flow data from within Chollas Creek, upstream and downstream of enhancement (Outcome Level 4) • Chemistry data from Chollas Creek, upstream and downstream of enhancement and study area (Outcome Level 4) • Number of educational materials handed out (Outcome Level 1) • Survey of residents (Outcome Level 2) • Cost to implement education program (Outcome Level 1) • Cost to implement habitat enhancement (Outcome Level 1) • Number of volunteers associated with monitoring and education outreach (Outcome Level 1) • Number of citizens approached (Outcome Level 1) • Ecological health improvements due to habitat enhancement (macro invertebrate analysis)

TITLE: **Chollas Creek Watershed Street Sweeping, Phase I**
ID NUMBER: **XXX**

ACTIVITY DESCRIPTION

The City's Storm Water Pollution Prevention Division (Storm Water Division) is coordinating with the City's Street Division to conduct a 24-month street sweeping effectiveness study in the Chollas Creek Watershed. The study will investigate the effectiveness of vacuum-assisted street sweepers compared to mechanical sweepers in reducing the accumulation of metals on City streets and whether changes to the current street sweeping schedule (baseline) will assist the City in attaining its water quality goals. The City's objective in conducting this study is to reduce the street accumulation of debris containing metals that may then migrate via storm water and other urban runoff to the storm water conveyance system and eventually into impaired receiving waters. The study includes the purchase of two types of vacuum-assisted sweepers, the dedication of operators; assignment of the sweepers to designated routes within identified priority areas; and a monitoring program to assess the effectiveness of the sweepers and frequency.

The City is using the prioritization process that is outlined in its *Strategic Plan for Watershed Activity Implementation* (July 2007) to target areas within the Chollas Creek Watershed. Based on this prioritization plan and meetings held with the Street Division, the routes that have been selected are in the two highest priority sectors of the Chollas Creek Watershed that have a higher potential for metals loading.

This aggressive street sweeping project has also been developed based on the findings of the Dry Weather Air Deposition Study that included sites in the Chollas Creek Watershed. The findings of this study indicate a greater than 60% contribution to metals loading from air deposition in Chollas Creek. The sources of the metals depositions are predominately from cars (brakes and tires) and also include potential industrial and commercial sources that are concentrated in the lower portion of the watershed. The City, therefore, is developing this street sweeping program to reduce metals loading and assess the most effective approach to reducing metals loading. This effectiveness assessment monitoring for the street sweeping project would be coordinated with additional air deposition sampling and effectiveness monitoring of combined Tier I and Tier II BMPs in Chollas Creek to develop recommendations regarding modification and possible expansion of these BMPs to meet the TMDL requirements.

TMDL APPLICABILITY

- Chollas Creek Dissolved Metals TMDL

TIME SCHEDULE FOR IMPLEMENTATION

Project planning began in September 2006. The City anticipates sweeping to start within winter 2008 through summer 2010. Debris testing and water quality monitoring will be conducted throughout the project to assess effectiveness in removing metals from City streets.

PARTICIPATING WATERSHED COPERMITTEE(S)

- City of San Diego

OTHER PARTICIPATING ENTITIES

- N/A

HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED

- Metals

CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY

The Collective Watershed Strategy for the San Diego Bay WMA identifies metals as a high priority water quality problem in the Pueblo Watershed (more specifically Hydrologic Area 908.2) and recommends implementing load reduction/source abatement activities to address it. Targeted increased sweeping will target metals on City streets.

EXPECTED BENEFITS

The street sweeping effectiveness study will consist of acquiring two types of top-tier vacuum-assisted street sweeper to operate within the Chollas Creek Watershed and assessing their effectiveness in reducing the accumulation of metals on area streets through an effectiveness assessment monitoring program. This study will augment the City's current sweeping efforts in order to also determine the optimum frequency of sweeping, starting at the present baseline schedule, towards reducing the loading of metals. The monitoring program will include simulated wet weather events for both type of vacuum-assisted sweepers and the mechanical sweepers currently used throughout the City. The amount of debris (in pounds) that is removed by sweeper type and frequency will be assessed during dry and wet periods of the year. The composition of the debris removed will be evaluated through analytical analysis and grain size distribution to determine the specific pollutant load reduction achieved by each method and frequency identified in the work plan. As discussed above, this study will be performed in coordination with additional air deposition studies and BMP effectiveness monitoring of the MS4 to develop recommendations on the modification and/or expansion of these activities to reduce metals loading to meet the TMDL requirements.

This activity will simultaneously address requirements under the Municipal Permit and Chollas Creek Dissolved Metals TMDL.

EFFECTIVENESS MEASUREMENTS

Management Questions:	• Which street sweeping machine is most effective in removing contaminants of concern (mechanical or vacuum-assisted)? • Is sweeping more frequently more effective than less frequent street sweeping in debris removal? • What is the optimal street sweeping frequency/method? • What is the impact of street sweeping on COCs in stormwater runoff?
Targeted Measurable Outcome(s)	• Achieve load reduction for sediments and metals based on monitoring information • Observer receiving water quality improvement
Assessment Method(s)	• Monitoring (e.g., collect data to estimate loads, concentrations of COCs in runoff) • Tabulation (e.g., amount of money to buy vacuum assisted street sweepers) • Quantification (e.g., load estimate comparison between sweeping methods)

Assessment Measures, Assessment Outcome Levels & Data:	• Tons of debris removed by land use for mechanical and vacuum-assisted sweepers (Outcome Level 4) • Frequency of removal correlated to tons of debris removed (Outcome Level 1 and 4) • Post-sweeping COC concentrations in runoff (Outcome Level 4) • Cost of vacuum-assisted sweepers (Outcome Level 1) • Cost of increased/decreased frequency of sweeping (man-hours, equipment costs, etc) (Outcome Level 1)

TITLE: **Targeted Municipal Facility Inspections**
ID NUMBER: **XXX**

ACTIVITY DESCRIPTION

The Storm Water Pollution Prevention Division (Storm Water Division) is developing a focused inspection activity to target municipal facilities within the San Diego Bay WMA. The purpose of the activity is to:

- Determine the most efficient frequency of inspections to ensure proper BMP implementation and reduce pollutant loading (e.g., once vs. twice per fiscal year)
- Determine the most efficient type of inspection to ensure proper BMP implementation and reduce pollutant loading (e.g., random inspections vs. scheduled inspections)
- Determine the most efficient combination of enforcement action to ensure proper BMP implementation and reduce pollutant loading (e.g., education/flyers vs. monetary fines vs. onsite direct interactions)
- Characterize activities at municipal facilities to determine which activities cause the greatest pollutant discharges to better direct focused education/outreach and enforcement efforts
- Track and analyze inspection and enforcement actions to estimate load reductions resulting from inspections

The Storm Water Division will delineate a specific area within the San Diego Bay WMA to conduct the targeted inspections based on factors, such as monitoring data, facility clustering, and proximity to other watershed activities being conducted. Discharges cleaned up, behaviors corrected, and sources abated will also be reported. The Storm Water Division anticipates using the knowledge and experienced gained through this activity to optimize the City's municipal facility inspection program to meet Municipal Permit and TMDL requirements.

TMDL APPLICABILITY

- San Diego Region Beaches and Creeks Bacteria TMDL
- Chollas Creek Dissolved Metals TMDL

TIME SCHEDULE FOR IMPLEMENTATION

Activity planning began in July 2007. The Storm Water Division anticipates selecting and hiring a consultant on board by the end of calendar year 2007 to help develop and implement the activity within FY 2008 through FY 2010.

PARTICIPATING WATERSHED COPERMITTEE(S)

- City of San Diego

OTHER PARTICIPATING ENTITIES

- N/A

HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED

- Bacteria
- Metals

CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY

The Collective Watershed Strategy for the San Diego Bay WMA identifies bacteria and metals as high priority water quality problems in the WMA and recommends implementing load reduction/source abatement activities to address it. Implementation of this focused inspection activity will contribute to addressing discharges, correct behaviors, and abate sources associated with bacteria and metals at municipal facilities.

EXPECTED BENEFITS

This focused inspection activity will contribute to reducing discharges, characterizing activities, correcting behaviors, and abating sources associated with bacteria at municipal facilities. Knowledge and experience gained through this activity would help the City optimize its municipal facility inspection program.

EFFECTIVENESS MEASUREMENTS

Management Questions:	• Do inspections increase rate of BMP implementation? • Does increased rate of BMP implementation affect load reduction? • What is the optimal frequency of inspection (point of diminishing returns)? • Are spot inspections more effective than scheduled inspections? • Does enforcement alter future behavior (implementing BMPs)? • Does education increase rate of BMP implementation? • How can an estimate of load reduction be made from inspection data?
Targeted Measurable Outcome(s)	• Achieve load reduction from optimized inspection rate • Achieve greater BMP implementation from optimized inspection rate
Assessment Method(s)	• Inspections (e.g., track number of BMPs implemented, increased number of BMPs, number of follow-up inspections) • Quantification (e.g., use frequency of BMP implementation to calculate estimated load reduction) • Monitoring (e.g., collect special study information to collect concentrations and flows to estimate load reduction) • Tabulation (e.g., amount of money spent on inspections, amount of money spent on educational materials) • Reporting (e.g., estimates of load reduction for BMPs from 3rd party data)
Assessment Measures, Assessment Outcome Levels & Data:	• Number of inspections (spot and scheduled) (Outcome Level 1) • Number of BMPs implemented (Outcome Level 1) • Change (%) in BMP implementation pre and post-education (Outcome Level 3) • Number of missing BMPs (Outcome Level 1) • Number of follow-up inspections (Outcome Level 1) • Number of enforcement follow-ups (Outcome Level 1) • Number of educational information items passed out (Outcome Level 1) • How much money spent on inspections (follow ups, initial inspections, enforcement actions)? (Outcome Level 1) • Literature review or other information to provide data to estimate load reductions (Outcome Level 3) • Dataset of load contributions for specific activities (Outcome Level 4)

TITLE: **Targeted Auto-Related Facility Inspections**
ID NUMBER: **XXX**

ACTIVITY DESCRIPTION

The Storm Water Pollution Prevention Division (Storm Water Division) is developing a focused inspection activity to target auto-related facilities within the San Diego Bay WMA. The purpose of the activity is to:

- Determine the most efficient frequency of inspections to ensure proper BMP implementation and reduce pollutant loading (e.g., once vs. twice per fiscal year)
- Determine the most efficient type of inspection to ensure proper BMP implementation and reduce pollutant loading (e.g., random inspections vs. scheduled inspections)
- Determine the most efficient combination of enforcement action to ensure proper BMP implementation and reduce pollutant loading (e.g., education/flyers vs. monetary fines vs. onsite direct interactions)
- Characterize activities at auto-related facilities to determine which activities cause the greatest pollutant discharges to better direct focused education/outreach and enforcement efforts
- Track and analyze inspection and enforcement actions to estimate load reductions resulting from inspections

The Storm Water Division will delineate a specific area within the San Diego Bay WMA to conduct the targeted inspections based on factors, such as monitoring data, facility clustering, and proximity to other watershed activities being conducted. Discharges cleaned up, behaviors corrected, and sources abated will also be reported. The Storm Water Division anticipates using the knowledge and experienced gained through this activity to optimize the City's jurisdictional industrial and commercial facility inspection program to meet Municipal Permit and TMDL requirements.

TMDL APPLICABILITY

- Chollas Creek Dissolved Metals TMDL

TIME SCHEDULE FOR IMPLEMENTATION

Activity planning began in July 2007. The Storm Water Division anticipates selecting and hiring a consultant on board by the end of calendar year 2007 to help develop and implement the activity in spring 2008.

PARTICIPATING WATERSHED COPERMITTEE(S)

- City of San Diego

OTHER PARTICIPATING ENTITIES

- N/A

HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED

- Metals

CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY

The Collective Watershed Strategy for the San Diego Bay WMA identifies metals as a high priority water quality problem in the Pueblo Watershed (more specifically Hydrologic Area 908.2) and recommends implementing load reduction/source abatement activities to address it. Implementation of this focused inspection activity will contribute to addressing discharges, correct behaviors, and abate sources associated with metals.

EXPECTED BENEFITS

This focused inspection activity will contribute to reducing discharges, characterizing activities, correcting behaviors, and abating sources associated with metals at auto-related facilities. Knowledge and experience gained through this activity will help the City optimize its jurisdictional industrial and commercial facility inspection program.

EFFECTIVENESS MEASUREMENTS

Management Questions:	• Do inspections increase rate of BMP implementation? • Does increased rate of BMP implementation affect load reduction? • What is the optimal frequency of inspection (point of diminishing returns)? • Are spot inspections more effective than scheduled inspections? • Does enforcement alter future behavior (implementing BMPs)? • Does education increase rate of BMP implementation? • How can an estimate of load reduction be made from inspection data?
Targeted Measurable Outcome(s)	• Achieve load reduction from optimized inspection rate • Achieve greater BMP implementation from optimized inspection rate
Assessment Method(s)	• Inspections (e.g., track number of BMPs implemented, increased number of BMPs, number of follow-up inspections) • Quantification (e.g., use frequency of BMP implementation to calculate estimated load reduction) • Monitoring (e.g., collect special study information to collect concentrations and flows to estimate load reduction) • Tabulation (e.g., amount of money spent on inspections, amount of money spent on educational materials) • Reporting (e.g., estimates of load reduction for BMPs from 3rd party data)
Assessment Measures, Assessment Outcome Levels & Data:	• Number of inspections (spot and scheduled) (Outcome Level 1) • Number of BMPs implemented (Outcome Level 1) • Change (%) in BMP implementation pre and post-education (Outcome Level 3) • Number of missing BMPs (Outcome Level 1) • Number of follow-up inspections (Outcome Level 1) • Number of enforcement follow-ups (Outcome Level 1) • Number of educational information items passed out (Outcome Level 1) • How much money spent on inspections (follow ups, initial inspections, enforcement actions)? (Outcome Level 1) • Literature review or other information to provide data to estimate load reductions (Outcome Level 3) • Dataset of load contributions for specific activities (Outcome Level 4)

TITLE: **Targeted Metals-Related Industrial Facility Inspections**
ID NUMBER: **XXX**

ACTIVITY DESCRIPTION

The Storm Water Pollution Prevention Division (Storm Water Division) is developing a focused inspection activity to target metals-related industrial facilities within the San Diego Bay WMA. The purpose of the activity is to:

- Determine the most efficient frequency of inspections to ensure proper BMP implementation and reduce pollutant loading (e.g., once vs. twice per fiscal year)
- Determine the most efficient type of inspection to ensure proper BMP implementation and reduce pollutant loading (e.g., random inspections vs. scheduled inspections)
- Determine the most efficient combination of enforcement action to ensure proper BMP implementation and reduce pollutant loading (e.g., education/flyers vs. monetary fines vs. onsite direct interactions)
- Characterize activities at metals-related industrial facilities to determine which activities cause the greatest pollutant discharges to better direct focused education/outreach and enforcement efforts
- Track and analyze inspection and enforcement actions to estimate load reductions resulting from inspections

The Storm Water Division will delineate a specific area within the San Diego Bay WMA to conduct the targeted inspections based on factors, such as monitoring data, facility clustering, and proximity to other watershed activities being conducted. Discharges cleaned up, behaviors corrected, and sources abated will also be reported. The Storm Water Division anticipates using the knowledge and experienced gained through this activity to optimize the City's jurisdictional industrial and commercial facility inspection program to meet Municipal Permit and TMDL requirements.

TMDL APPLICABILITY

- Chollas Creek Dissolved Metals TMDL

TIME SCHEDULE FOR IMPLEMENTATION

Activity planning began in July 2007. The Storm Water Division anticipates selecting and hiring a consultant on board by the end of calendar year 2007 to help develop and implement the activity in spring 2008.

PARTICIPATING WATERSHED COPERMITTEE(S)

- City of San Diego

OTHER PARTICIPATING ENTITIES

- N/A

HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED

- Metals

CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY

The Collective Watershed Strategy for the San Diego Bay WMA identifies metals as a high priority water quality problem in the Pueblo Watershed (more specifically Hydrologic Area 908.2) and recommends implementing load reduction/source abatement activities to address it. Implementation of this focused inspection activity will contribute to addressing discharges, correct behaviors, and abate sources associated with metals.

EXPECTED BENEFITS

This focused inspection activity will contribute to addressing discharges, characterizing activities, correcting behaviors, and abating sources associated with metals at metals-related industrial facilities. Knowledge and experience gained through this activity will help the City optimize its jurisdictional industrial and commercial facility inspection program.

EFFECTIVENESS MEASUREMENTS

Management Questions:	• Do inspections increase rate of BMP implementation? • Does increased rate of BMP implementation affect load reduction? • What is the optimal frequency of inspection (point of diminishing returns)? • Are spot inspections more effective than scheduled inspections? • Does enforcement alter future behavior (implementing BMPs)? • Does education increase rate of BMP implementation? • How can an estimate of load reduction be made from inspection data?
Targeted Measurable Outcome(s)	• Achieve load reduction from optimized inspection rate • Achieve greater BMP implementation from optimized inspection rate
Assessment Method(s)	• Inspections (e.g., track number of BMPs implemented, increased number of BMPs, number of follow-up inspections) • Quantification (e.g., use frequency of BMP implementation to calculate estimated load reduction) • Monitoring (e.g., collect special study information to collect concentrations and flows to estimate load reduction) • Tabulation (e.g., amount of money spent on inspections, amount of money spent on educational materials) • Reporting (e.g., estimates of load reduction for BMPs from 3rd party data)
Assessment Measures, Assessment Outcome Levels & Data:	• Number of inspections (spot and scheduled) (Outcome Level 1) • Number of BMPs implemented (Outcome Level 1) • Change (%) in BMP implementation pre and post-education (Outcome Level 3) • Number of missing BMPs (Outcome Level 1) • Number of follow-up inspections (Outcome Level 1) • Number of enforcement follow-ups (Outcome Level 1) • Number of educational information items passed out (Outcome Level 1) • How much money spent on inspections (follow ups, initial inspections, enforcement actions)? (Outcome Level 1) • Literature review or other information to provide data to estimate load reductions (Outcome Level 3) • Dataset of load contributions for specific activities (Outcome Level 4)

TITLE: **Targeted Restaurant Facility Inspections**
ID NUMBER: **XXX**

ACTIVITY DESCRIPTION

The Storm Water Pollution Prevention Division (Storm Water Division) is developing a focused inspection activity to target restaurant facilities within the San Diego Bay WMA. The purpose of the activity is to:

- Determine the most efficient frequency of inspections to ensure proper BMP implementation and reduce pollutant loading (e.g., once vs. twice per fiscal year)
- Determine the most efficient type of inspection to ensure proper BMP implementation and reduce pollutant loading (e.g., random inspections vs. scheduled inspections)
- Determine the most efficient combination of enforcement action to ensure proper BMP implementation and reduce pollutant loading (e.g., education/flyers vs. monetary fines vs. onsite direct interactions)
- Characterize activities at restaurant metals-related industrial facilities to determine which activities cause the greatest pollutant discharges to better direct focused education/outreach and enforcement efforts
- Track and analyze inspection and enforcement actions to estimate load reductions resulting from inspections

The Storm Water Division will delineate a specific area within the San Diego Bay WMA to conduct the targeted inspections based on factors, such as monitoring data, facility clustering, and proximity to other watershed activities being conducted. Discharges cleaned up, behaviors corrected, and sources abated will also be reported. The Storm Water Division anticipates using the knowledge and experienced gained through this activity to optimize the City's jurisdictional industrial and commercial facility inspection program to meet Municipal Permit and TMDL requirements.

TMDL APPLICABILITY

- San Diego Region Beaches and Creeks Bacteria TMDL

TIME SCHEDULE FOR IMPLEMENTATION

Activity planning began in July 2007. The Storm Water Division anticipates selecting and hiring a consultant on board by the end of calendar year 2007 to help develop and implement the activity in spring 2008.

PARTICIPATING WATERSHED COPERMITTEE(S)

- City of San Diego

OTHER PARTICIPATING ENTITIES

- N/A

HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED

- Bacteria

CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY

The Collective Watershed Strategy for the San Diego Bay WMA identifies bacteria as a high priority water quality problem throughout the WMA and recommends implementing load reduction/source abatement activities to address it. Implementation of this focused inspection activity will contribute to addressing discharges, correct behaviors, and abate sources associated with bacteria.

EXPECTED BENEFITS

This focused inspection activity will contribute to reducing discharges, characterizing activities, correcting behaviors, and abating sources associated with bacteria at restaurant facilities. Knowledge and experience gained through this activity would help the City optimize its jurisdictional industrial and commercial facility inspection program.

EFFECTIVENESS MEASUREMENTS

Management Questions:	• Do inspections increase rate of BMP implementation? • Does increased rate of BMP implementation affect load reduction? • What is the optimal frequency of inspection (point of diminishing returns)? • Are spot inspections more effective than scheduled inspections? • Does enforcement alter future behavior (implementing BMPs)? • Does education increase rate of BMP implementation? • How can an estimate of load reduction be made from inspection data?
Targeted Measurable Outcome(s)	• Achieve load reduction from optimized inspection rate • Achieve greater BMP implementation from optimized inspection rate
Assessment Method(s)	• Inspections (e.g., track number of BMPs implemented, increased number of BMPs, number of follow-up inspections) • Quantification (e.g., use frequency of BMP implementation to calculate estimated load reduction) • Monitoring (e.g., collect special study information to collect concentrations and flows to estimate load reduction) • Tabulation (e.g., amount of money spent on inspections, amount of money spent on educational materials) • Reporting (e.g., estimates of load reduction for BMPs from 3rd party data)
Assessment Measures, Assessment Outcome Levels & Data:	• Number of inspections (spot and scheduled) (Outcome Level 1) • Number of BMPs implemented (Outcome Level 1) • Change (%) in BMP implementation pre and post-education (Outcome Level 3) • Number of missing BMPs (Outcome Level 1) • Number of follow-up inspections (Outcome Level 1) • Number of enforcement follow-ups (Outcome Level 1) • Number of educational information items passed out (Outcome Level 1) • How much money spent on inspections (follow ups, initial inspections, enforcement actions)? (Outcome Level 1) • Literature review or other information to provide data to estimate load reductions (Outcome Level 3) • Dataset of load contributions for specific activities (Outcome Level 4)

TITLE: **Targeted Residential Activity Characterization**
ID NUMBER: **XXX**

ACTIVITY DESCRIPTION

The Storm Water Pollution Prevention Division (Storm Water Division) is developing an activity to target behaviors at residential sites within the San Diego Bay WMA. The purpose of the activity is to:

- Determine the most efficient type of effort to ensure proper BMP implementation and reduce pollutant loading (e.g., education vs. incentives vs. monetary fines)
- Determine the most efficient combination of "enforcement" action to ensure proper BMP implementation and reduce pollutant loading (e.g., education/materials distribution vs. monetary fines vs. onsite direct interactions vs. Community Based Social Marketing methodology)
- Observe and characterize residential sites/activities regarding their contribution to water quality problems to better direct focused education/outreach and enforcement efforts
- Track and analyze observations and efforts to estimate load reductions thereby resulting

The Storm Water Division will delineate a specific area within the San Diego Bay WMA to conduct the effort based on factors, such as monitoring data, facility clustering, and proximity to other watershed activities being conducted. Specific residential activities to observe and characterize will be determined. Discharges cleaned up, behaviors corrected, and sources abated will also be reported. The Storm Water Division anticipates using the knowledge and experienced gained through this activity to optimize the City's jurisdictional residential program to meet Municipal Permit and TMDL requirements.

TMDL APPLICABILITY

- San Diego Region Beaches and Creeks Bacteria TMDL
- Chollas Creek Dissolved Metals TMDL
- Chollas Creek Diazinon TMDL

TIME SCHEDULE FOR IMPLEMENTATION

Activity planning and development began in July 2007 and are anticipated to continue through FY 2010. The Storm Water Division anticipates implementing the activity in spring 2008.

PARTICIPATING WATERSHED COPERMITTEE(S)

- City of San Diego

OTHER PARTICIPATING ENTITIES

- N/A

HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED

- Bacteria
- Metals

CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY

The Collective Watershed Strategy for the San Diego Bay WMA identifies metals and bacteria as high priority water quality problems in the WMA and recommends implementing load reduction/source abatement activities to address them. Implementation of this targeted residential activity characterization will contribute to addressing discharges, correct behaviors, and abate sources associated with metals and bacteria.

EXPECTED BENEFITS

This targeted residential activity characterization will contribute to addressing discharges, correcting behaviors, and abating sources associated with metals and bacteria at residential sites.

In addition, implementation of this activity is in accordance with the City's *Strategic Plan for Watershed Implementation* (July 2007). Knowledge and experience gained through this activity will help the City optimize its jurisdictional residential program.

EFFECTIVENESS MEASUREMENTS

Management Questions:	• Does education for effects of specific residential activities result in fewer observed instances of the activity? • Does behavior change effect load reduction? • What is the optimal frequency of education and outreach (point of diminishing returns)? • Does enforcement alter future behavior (fewer observed instances of target behavior)? • How can an estimate of load reduction be made from inspection data?
Targeted Measurable Outcome(s)	• Achieve load reduction from optimized inspection rate • Achieve greater BMP implementation from optimized inspection rate (over time)
Assessment Method(s)	• Inspections (e.g., track number of target behaviors observed, decrease in observed behavior, number of follow-up inspections) • Quantification (e.g., use frequency of observed behavior to calculate estimated load reduction) • Monitoring (e.g., collect special study information to collect concentrations and flows to estimate load reduction) • Tabulation (e.g., amount of money spent on inspections, amount of money spent on educational materials) • Reporting (e.g., estimates of load reduction for BMPs from 3rd party data)
Assessment Measures, Assessment Outcome Levels & Data:	• Number of inspections (spot and scheduled) (Outcome Level 1) • Number of outreach materials handed out (Outcome Level 1) • Change (%) in target behavior pre and post-education (Outcome Level 3) • Number of follow-up inspections (Outcome Level 1) • Number of enforcement follow-ups (Outcome Level 1) • How much money spent on inspections (follow ups, initial inspections, enforcement actions)? (Outcome Level 1) • Literature review or other information to provide data to estimate load reductions (Outcome Level 3) • Dataset of load contributions for specific activities (Outcome Level 4)

TITLE: **Dalbergia Street "Green Mall" Infiltration BMP Retrofit**
ID NUMBER: **XXX**

ACTIVITY DESCRIPTION

This project will remove conventional asphalt paving along Dalbergia Street and Thor Street (industrial/commercial area) and replace it with pervious concrete paving. In addition, the existing curb and gutter along portions of Dalbergia Street will be moved 12 feet into the right of way, and, in between the existing and new curb lines, bio-retention planter boxes will be placed and filled with crushed rock. Both the pervious concrete and bio-retention planter boxes will allow urban runoff and the associated pollutants to infiltrate into the ground, thereby reducing pollutant loading into receiving waters. The City has named this model approach for Low Impact Development (LID) in commercial and industrial areas as "Green Mall" and, if proven to be effective, anticipates eventually implementing similar LID projects on a broader scale throughout the San Diego Bay WMA to comply with both Municipal Permit and TMDL requirements.

TMDL APPLICABILITY

- Chollas Creek Dissolved Metals TMDL
- San Diego Region Beaches and Creeks Bacteria TMDL

TIME SCHEDULE FOR IMPLEMENTATION

Project planning began in September 2006. Design and award of contract are anticipated to occur April 2008 through May 2010. Construction is anticipated to occur June through October 2010. Water quality monitoring will be conducted before and after construction to assess the effectiveness in reducing runoff volume and pollutant loading.

PARTICIPATING WATERSHED COPERMITTEE(S)

- City of San Diego

OTHER PARTICIPATING ENTITIES

- San Diego Coastkeeper – project supporter
- Groundwork San Diego-Chollas Creek – project supporter

HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED

- Metals
- Bacteria

CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY

The Collective Watershed Strategy for the San Diego Bay WMA identifies metals and bacteria as high priority water quality problems in the Pueblo Watershed (more specifically Hydrologic Area 908.2) and recommends implementing load reduction/source abatement activities to address them. Implementation of this activity will address both high priority water quality problems by reducing and treating runoff volume via infiltration.

EXPECTED BENEFITS

Implementation of this activity will reduce pollutant loading by reducing and treating runoff volume of pollutants via infiltration.

In addition, implementation of this activity is in accordance with the City's *Strategic Plan for Watershed Activity Implementation* (July 2007), which calls for the piloting of infiltration BMPs to reduce urban runoff pollution. Knowledge and experience gained through this activity will help the City document the benefits, limitations, and challenges of infiltration as an urban runoff pollution control before implementation on a broader scale throughout its jurisdiction in meeting Municipal Permit and TMDL requirements.

EFFECTIVENESS MEASUREMENTS

Management Questions:	• What is the load reduction efficiency of LID BMP retrofits? • How effective are LID BMP retrofits at reducing loads of priority pollutants? • Does the implementation of LID BMP retrofits result in a detectible receiving water quality improvement?
Targeted Measurable Outcome(s)	• Reduction in priority pollutant loads • Receiving water quality improvement
Assessment Method(s)	• Inspections (e.g., ensure the retrofit is working as designed) • Quantification (e.g., use drainage area and rainfall information to calculate estimated load reduction) • Monitoring (e.g., collect special study information to collect concentrations and flows to estimate load reduction) • Tabulation (e.g., amount of money spent on implementation and maintenance, amount of money spent on educational materials) • Reporting (e.g., estimates of load reduction from 3rd party data)
Assessment Measures, Assessment Outcome Levels & Data:	• Number of inspections (Outcome Level 1) • Change (%) in load reduction pre and post-implementation (Outcome Level 4) • Number of educational information items passed out (Outcome Level 1) • How much money spent on inspections and maintenance (Outcome Level 1) • Literature review or other information to provide data to estimate load reductions (Outcome Level 3) • Dataset of load contributions for specific activities (Outcome Level 4)

TITLE: **Memorial Park "Green Lot" Infiltration BMP Retrofit**
ID NUMBER: **XXX**

ACTIVITY DESCRIPTION

This activity will involve the installation of a large underground chamber to collect and then slowly infiltrate urban runoff into the underlying subsoils. This underground system will be located within Memorial Park, thereby transforming the recreational facility into a dual-use site for both urban runoff pollution reduction and recreation. The project will be designed to address an integrated approach of meeting current and pending pollutant reduction goals for the dissolved metals, bacteria, and pesticides TMDLs. The pollutant load reduction from this facility will, therefore, meet requirements under current and anticipated TMDLs in the receiving waters of Chollas Creek, which flows into the San Diego Bay. This project will also provide a direct and measurable load reduction to the San Diego Bay Watershed. The City has named this model approach for Low Impact Development (LID) as "Green Lots" and, if proven to be effective, anticipates eventually implementing similar LID projects on a broader scale throughout the San Diego Bay WMA to comply with both Municipal Permit and TMDL requirements.

TMDL APPLICABILITY

- Chollas Creek Dissolved Metals TMDL
- San Diego Region Beaches and Creeks Bacteria TMDL

TIME SCHEDULE FOR IMPLEMENTATION

Project planning began in September 2006. Design and award of contract are anticipated to occur April 2008 through May 2010. Construction is anticipated to occur June through October 2010. Water quality monitoring will be conducted before and after construction to assess the effectiveness in reducing runoff volume and pollutant loading.

PARTICIPATING WATERSHED COPERMITTEE(S)

- City of San Diego

OTHER PARTICIPATING ENTITIES

- San Diego Coastkeeper – project supporter

HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED

- Metals
- Bacteria

CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY

The Collective Watershed Strategy for the San Diego Bay WMA identifies metals and bacteria as high priority water quality problems in the Pueblo Watershed (more specifically Hydrologic Area 908.2) and recommends implementing load reduction/source abatement activities to address them. Implementation of this activity will address both high priority water quality problems by reducing and treating runoff volume via infiltration/retention.

EXPECTED BENEFITS

Implementation of this activity will reduce pollutant loading by reducing and treating runoff volume of pollutants via infiltration/retention.

In addition, implementation of this activity is in accordance with the City's *Strategic Plan for Watershed Activity Implementation* (July 2007), which calls for the piloting of infiltration/retention BMPs to reduce urban runoff pollution. Knowledge and experience gained through this activity will help the City document the benefits, limitations, and challenges of infiltration/retention as an urban runoff pollution control before implementation on a broader scale throughout its jurisdiction in meeting Municipal Permit and TMDL requirements.

EFFECTIVENESS MEASUREMENTS

Management Questions:	• What is the load reduction efficiency of LID BMP retrofits? • How effective are LID BMP retrofits at reducing loads of priority pollutants? • Does the implementation of LID BMP retrofits result in a detectible receiving water quality improvement?
Targeted Measurable Outcome(s)	• Reduction in priority pollutant loads • Receiving water quality improvement
Assessment Method(s)	• Inspections (e.g., ensure the retrofit is working as designed) • Quantification (e.g., use drainage area and rainfall information to calculate estimated load reduction) • Monitoring (e.g., collect special study information to collect concentrations and flows to estimate load reduction) • Tabulation (e.g., amount of money spent on implementation and maintenance, amount of money spent on educational materials) • Reporting (e.g., estimates of load reduction from 3rd party data)
Assessment Measures, Assessment Outcome Levels & Data:	• Number of inspections (Outcome Level 1) • Change (%) in load reduction pre and post-implementation (Outcome Level 4) • Number of educational information items passed out (Outcome Level 1) • How much money spent on inspections and maintenance (Outcome Level 1) • Literature review or other information to provide data to estimate load reductions (Outcome Level 3) • Dataset of load contributions for specific activities (Outcome Level 4)

TITLE: **Municipal Rain Barrel Installation and Downspout Disconnects**
ID NUMBER: **XXX**

ACTIVITY DESCRIPTION

This activity will involve the installation of rain barrels and/or the disconnection of downspouts to direct runoff from municipal facility roofs into pervious areas (such as landscaping) for infiltration. Rain barrels, downspout disconnects, and rainwater harvesting/reuse systems help to capture, store, and divert urban runoff to reduce the volume thereof, thus contributing to reduced flooding, erosion, and the contamination of surface water with sediment, fertilizer, metals, and pesticides. In addition, this activity has the added benefit of water conservation; runoff collected and diverted to landscaping would help reduce the amount of potable water needed for irrigation. Roof runoff solutions can be used both in large-scale landscapes, such as municipal buildings, community centers, schools, and commercial sites, as well as in small residential landscapes.

TMDL APPLICABILITY

- Chollas Creek Dissolved Metals TMDL
- San Diego Region Beaches and Creeks Bacteria TMDL

TIME SCHEDULE FOR IMPLEMENTATION

Project planning began in July 2007 and is anticipated to continue until the end of calendar year 2007. Procurement of rain barrels and other items and installation are anticipated to occur from November 2007 through February 2008.

PARTICIPATING WATERSHED COPERMITTEE(S)

- City of San Diego

OTHER PARTICIPATING ENTITIES

- San Diego Coastkeeper – project supporter

HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED

- Metals
- Bacteria

CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY

The Collective Watershed Strategy for the San Diego Bay WMA identifies metals and bacteria as high priority water quality problems in the Pueblo Watershed (more specifically Hydrologic Area 908.2) and recommends implementing load reduction/source abatement activities to address them. Implementation of this activity will address both high priority water quality problems by reducing runoff volume via capture, retention, and infiltration.

EXPECTED BENEFITS

Implementation of this activity will reduce pollutant loading by reducing runoff volume via capture, retention, and eventual infiltration.

In addition, implementation of this activity is in accordance with the City's *Strategic Plan for Watershed Activity Implementation* (July 2007), which calls for the piloting of rain barrels,

downspout disconnects, and rainwater harvesting/reuse systems to reduce urban runoff volume and pollution. Knowledge and experience gained through this activity will help the City document the benefits, limitations, and challenges of rain barrels and downspout disconnects as urban runoff pollution controls before implementation on a broader scale throughout its jurisdiction in meeting Municipal Permit and TMDL requirements.

EFFECTIVENESS MEASUREMENTS

Management Questions:	• What is the effectiveness/efficiency of rain barrel/rain-harvesting systems in reducing stormwater runoff volume? • What is the loading reduction of different systems? • Which system is most efficient in collecting and/or diverting rainwater? • Which system results in the largest load reductions?
Targeted Measurable Outcome(s)	• Achieve reduction in pollutant loads due to rain barrel installation
Assessment Method(s)	• Monitoring (e.g., load reduction estimation) • Quantification (e.g., calculation of load reductions, or estimates of change) • Tabulation (e.g., number of rain barrel systems installed, amount of money spent) • Reporting (e.g., 3rd party data to estimate load reductions)
Assessment Measures, Assessment Outcome Levels & Data:	• Cost of rain barrel systems (Outcome Level 1 and 2) • Cost of maintenance/upkeep (Outcome Level 1 and 2) • Cost of implementation (Outcome Level 1 and 2) • Volume of stormwater captured/diverted (Outcome Level 4) • Concentrations of COCs in rainwater or runoff (measured in rain barrel systems) (Outcome Level 4) • Compare 3rd party data to measured data for load reduction comparisons (Outcome Level 3) • What is the percent capture of the different systems (acres drained) (Outcome Level 4)

TITLE: **Trash Segregation Device Installation**
ID NUMBER: **XXX**

ACTIVITY DESCRIPTION

This project will involve the installation of devices along certain right-of-ways in the San Diego Bay WMA to prevent trash and debris from entering the MS4. Runoff entering an inlet with such a device will be cleaned of large trash and debris. It is anticipated that accumulation of such pollutants at the mouth of inlets will facilitate their collection by City crews using street sweepers. The City will study the effectiveness (in terms of load reduction) and the efficiency (in terms of load reduction divided by cost) of such devices in improving discharge and water quality impaired by bacteria, both in absolute terms and relative to other potential activities.

TMDL APPLICABILITY

- San Diego Region Beaches and Creeks Bacteria TMDL

TIME SCHEDULE FOR IMPLEMENTATION

Project planning began in July 2007, and project design is anticipated to continue through FY 2009. Installation is anticipated to occur in FY 2010. Water quality monitoring will be conducted before and after installation to assess the effectiveness in bacteria and trash loading.

PARTICIPATING WATERSHED COPERMITTEE(S)

- City of San Diego

OTHER PARTICIPATING ENTITIES

- San Diego Coastkeeper – project supporter

HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED

- Bacteria

CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY

The Collective Watershed Strategy for the San Diego Bay WMA identifies bacteria as a high priority water quality problem in the Pueblo Watershed (more specifically Hydrologic Area 908.2) and recommends implementing load reduction/source abatement activities to address it. Implementation of this activity will address bacteria via the facilitation of trash and debris removal.

EXPECTED BENEFITS

Implementation of this activity will reduce bacteria loading via facilitation of trash and debris removal. Literature published by the United States Environmental Protection Agency on its website[1] states that debris may be contaminated by pathogens that have adverse effects on humans. By reducing the amount of debris in the San Diego Bay WMA, bacteria loading is reduced.

[1] http://www.epa.gov/owow/oceans/debris/

In addition, implementation of this activity is in accordance with the City's *Strategic Plan for Watershed Activity Implementation* (July 2007), which calls for the piloting of trash segregation devices to reduce bacteria loading via facilitation of trash and debris removal. In addition, knowledge and experience gained through this activity will help the City document the benefits, limitations, and challenges of trash segregation devices as an urban runoff pollution control before implementation on a broader scale throughout its jurisdiction in meeting Municipal Permit and TMDL requirements.

EFFECTIVENESS MEASUREMENTS

Management Questions:	• Which type of trash segregation device facilitates the most efficient removal of trash and debris? • What is the load reduction efficiency of trash segregation devices in facilitating removal of trash? • How effective are trash segregation devices at facilitating reduction of loads of trash?
Targeted Measurable Outcome(s)	• Determination of most efficient and effective trash segregation device • Reduction in trash based on amount removed from areas with devices • Receiving water quality improvement (less observed trash in receiving water downstream)
Assessment Method(s)	• Inspections (e.g., ensure the retrofit is working as designed) • Quantification (e.g., use drainage area and rainfall information to calculate estimated load reduction) • Monitoring (e.g., collect special study information to collect concentrations and flows to estimate load reduction) • Tabulation (e.g., amount of money spent on implementation and maintenance, amount of money spent on educational materials)
Assessment Measures, Assessment Outcome Levels & Data:	• Number of inspections (Outcome Level 1) • Change (%) in load reduction pre and post-implementation (Outcome Level 4) • How much money spent on inspections and maintenance (Outcome Level 1) • Dataset of load contributions for specific activities (Outcome Level 4)

TITLE: **Inlet Bacteria Treatment BMP Installation**
ID NUMBER: **XXX**

ACTIVITY DESCRIPTION

This project will involve the installation of inlet treatment devices along certain right-of-ways in the San Diego Bay WMA in conjunction with trash segregation devices to treat runoff of bacteria entering the MS4. Runoff entering an inlet will be directed through a filter box to be sterilized of bacteria and then discharged. The City will study the effectiveness (in terms of load reduction) and the efficiency (in terms of load reduction divided by cost) of such devices in improving discharge and water quality impaired by bacteria, both in absolute terms and relative to other potential activities. The City hopes to determine the effect of such devices on discharge and water quality in combination with other activities, such as aggressive street sweeping.

TMDL APPLICABILITY

- San Diego Region Beaches and Creeks Bacteria TMDL

TIME SCHEDULE FOR IMPLEMENTATION

Project planning began in July 2007 and is anticipated to continue through FY 2009. Installation is anticipated to occur in FY 2010. Water quality monitoring will be conducted before and after installation to assess the effectiveness in bacteria loading.

PARTICIPATING WATERSHED COPERMITTEE(S)

- City of San Diego

OTHER PARTICIPATING ENTITIES

- San Diego Coastkeeper – project supporter

HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED

- Bacteria

CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY

The Collective Watershed Strategy for the San Diego Bay WMA identifies bacteria as a high priority water quality problem in the Pueblo Watershed (more specifically Hydrologic Area 908.2) and recommends implementing load reduction/source abatement activities to address it. Implementation of this activity will address bacteria via inlet treatment.

EXPECTED BENEFITS

Implementation of this activity will reduce bacteria loading via inlet treatment.

In addition, implementation of this activity is in accordance with the City's *Strategic Plan for Watershed Activity Implementation* (July 2007), which calls for the piloting of inlet treatment BMPs to reduce bacteria loading. Knowledge and experience gained through this activity would help the City document the benefits, limitations, and challenges of inlet treatment as an urban runoff pollution control before implementation on a broader scale throughout its jurisdiction in meeting Municipal Permit and TMDL requirements.

EFFECTIVENESS MEASUREMENTS

Management Questions:	• Which type of inlet bacteria treatment BMP provides the most efficient removal of trash and debris? • What is the load reduction efficiency of inlet bacterial treatment BMPs in reducing bacteria? • How effective are bacteria treatment BMPs at reducing loads of bacteria?
Targeted Measurable Outcome(s)	• Determination of most efficient and effective inlet bacteria treatment BMP • Reduction in bacteria based on amount removed from hydrodynamic separator • Discharge water quality improvement (less bacteria exceedances per monitoring)
Assessment Method(s)	• Inspections (e.g., ensure the inserts are working as designed) • Quantification (e.g., use drainage area and rainfall information to calculate estimated load reduction) • Monitoring (e.g., collect special study information to collect concentrations and flows to estimate load reduction) • Tabulation (e.g., amount of money spent on implementation and maintenance, amount of money spent on educational materials)
Assessment Measures, Assessment Outcome Levels & Data:	• Number of inspections (Outcome Level 1) • Change (%) in load reduction pre and post-implementation (Outcome Level 4) • How much money spent on inspections and maintenance (Outcome Level 1) • Dataset of load contributions for specific activities (Outcome Level 4)

TITLE: **Infiltration BMP Retrofit**
ID NUMBER: **XXX**

ACTIVITY DESCRIPTION

This activity will involve the implementation of an infiltration project in the San Diego Bay WMA to reduce runoff volume. The activity may be implemented in a municipal parking lot ("Green Mall"), an industrial/commercial right-of-way ("Green Mall"), or a residential right-of-way ("Green Street"). Exact location and type will be based on monitoring and geotechnical considerations, proximity to other BMPs being implemented, site availability, land use, etc. The pollutant load reduction resulting from this activity will contribute to meeting requirements under the Municipal Permit and current and anticipated TMDLs in the receiving waters of Chollas Creek, which flows into the San Diego Bay. This activity will also provide a direct and measurable load reduction to the San Diego Bay Watershed.

TMDL APPLICABILITY

- Chollas Creek Dissolved Metals TMDL
- San Diego Region Beaches and Creeks Bacteria TMDL

TIME SCHEDULE FOR IMPLEMENTATION

Project planning is anticipated to begin in fall 2007. Design and award of contract are anticipated to occur April 2008 through May 2011. Construction is anticipated to occur June through October 2011. Water quality monitoring will be conducted before and after construction to assess the effectiveness in reducing runoff volume and pollutant loading.

PARTICIPATING WATERSHED COPERMITTEE(S)

- City of San Diego

OTHER PARTICIPATING ENTITIES

- San Diego Coastkeeper – project supporter

HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED

- Metals
- Bacteria

CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY

The Collective Watershed Strategy for the San Diego Bay WMA identifies metals and bacteria as high priority water quality problems in the Pueblo Watershed (more specifically Hydrologic Area 908.2) and recommends implementing load reduction/source abatement activities to address them. Implementation of this activity will address both high priority water quality problems by reducing and treating runoff volume via infiltration/retention.

EXPECTED BENEFITS

Implementation of this activity will reduce pollutant loading by reducing and treating runoff volume of pollutants via infiltration/retention.

In addition, implementation of this activity is in accordance with the City's *Strategic Plan for Watershed Activity Implementation* (July 2007), which calls for the piloting of infiltration/retention BMPs to reduce urban runoff pollution. Knowledge and experience gained through this activity will help the City document the benefits, limitations, and challenges of infiltration/retention as an urban runoff pollution control before implementation on a broader scale throughout its jurisdiction in meeting Municipal Permit and TMDL requirements.

EFFECTIVENESS MEASUREMENTS

Management Questions:	• What is the load reduction efficiency of LID BMP retrofits? • How effective are LID BMP retrofits at reducing loads of priority pollutants? • Does the implementation of LID BMP retrofits result in a detectible receiving water quality improvement?
Targeted Measurable Outcome(s)	• Reduction in priority pollutant loads • Receiving water quality improvement
Assessment Method(s)	• Inspections (e.g., ensure the retrofit is working as designed) • Quantification (e.g., use drainage area and rainfall information to calculate estimated load reduction) • Monitoring (e.g., collect special study information to collect concentrations and flows to estimate load reduction) • Tabulation (e.g., amount of money spent on implementation and maintenance, amount of money spent on educational materials) • Reporting (e.g., estimates of load reduction from 3rd party data)
Assessment Measures, Assessment Outcome Levels & Data:	• Number of inspections (Outcome Level 1) • Change (%) in load reduction pre and post-implementation (Outcome Level 4) • Number of educational information items passed out (Outcome Level 1) • How much money spent on inspections and maintenance (Outcome Level 1) • Literature review or other information to provide data to estimate load reductions (Outcome Level 3) • Dataset of load contributions for specific activities (Outcome Level 4)

TITLE: **Public Service Announcement: *Karma* and *Karma Second Chance***
ID NUMBER: **XXX**

ACTIVITY DESCRIPTION

The City's Storm Water Division has retained a contract with a film production company to create two Public Service Announcements (PSAs) specifically focused on bacteria, with gross pollutants (trash) profiled as a vector. The PSAs are entitled, *Karma* and *Karma Second Chance*, and the goal of the PSAs is to educate the public about causes of pollution and to encourage positive behavioral change. These PSAs were developed in FY 2007 and FY 2008, and will be broadcast on several TV and radio stations throughout the San Diego Bay WMA in FY 2008. The PSAs will be broadcast in both English and Spanish.

TMDL APPLICABILITY

- San Diego Region Beaches and Creeks Bacteria TMDL

TIME SCHEDULE FOR IMPLEMENTATION

The City will coordinate completion of production in FY 2008, and then will work with various broadcast media outlets to distribute and air the PSAs in FY 2008 and FY 2009.

PARTICIPATING WATERSHED COPERMITTEE(S)

- City of San Diego

OTHER PARTICIPATING ENTITIES

- Various Television and Radio Stations in San Diego

HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED

- Bacteria
- Gross Pollutants (Trash)

CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY

The Collective Watershed Strategy for the San Diego Bay WMA identifies bacteria and gross pollutants as high priority water quality problems in the WMA. The *Karma* and *Karma Second Chance* Public Service Announcements will result in increased knowledge and awareness regarding bacteria, and trash as a vector, and result in future load reduction of trash and debris directly and of bacteria indirectly.

EXPECTED BENEFITS

The PSAs address bacteria directly by focusing on pet waste, food waste and organic matter, and indirectly by removing a bacterial source: trash. Literature published by the United States Environmental Protection Agency on its website[1] states that *pathogens* are microscopic organisms like bacteria and viruses. They come from untreated or poorly treated sewage, pet and farm animal waste, and improperly handled medical waste. Pathogens in the water in unsafe amounts result in beach closures; shellfish bed closures, fish kills, and human health problems.

[1] http://www.epa.gov/owow/oceans/debris/

EFFECTIVENESS MEASUREMENTS

PSA effectiveness will be measured on a variety of levels, to include the number of households (television) or listeners (radio) reached by the program will be tabulated. Second, awareness, attitude data will be collected via surveys. Third, once the PSAs have aired, another survey will be conducted to assess changes in knowledge and/or behavior. Recipients responding to and participating in the survey will also be assessed, such as volunteers, or those who agreed to commit to the project.

TITLE: **Community-Based Social Marketing Outreach Pilot Project – Chollas Creek Community**

ID NUMBER: **XXX**

ACTIVITY DESCRIPTION

The City's Storm Water Pollution Prevention Division found that research indicated that an emerging public education field called "Community-Based Social Marketing" (CBSM) has been used successfully to increase knowledge and change behaviors in environmental sustainability programs throughout the United States. CBSM is a relatively new area of environmental social science that relies heavily on the scientific method, which includes comprehensive research, pilot programs, data gathering, and assessment measures. The City plans to implement a pilot project using this approach in the Chollas Creek community of San Diego to attempt to achieve awareness and behavioral change. The City will retain professional research consultants to develop and initiate the pilot project. The project will include research, observations, surveys, interventions, and assessment methods. These efforts will result in recommendations for outreach strategies, which may include structural interventions, public participation, incentives and specific messaging.

TMDL APPLICABILITY

- Chollas Creek Dissolved Metals TMDL
- San Diego Region Beaches and Creeks Bacteria TMDL

TIME SCHEDULE FOR IMPLEMENTATION

Research and initial planning will occur in FY 2008, with outreach implementation occurring in FY 2009. Implementation, assessment, and evaluation will also continue to occur in FY 2009.

PARTICIPATING WATERSHED COPERMITTEE(S)

- City of San Diego

OTHER PARTICIPATING ENTITIES

- San Diego Coastkeeper
- Sierra Club, San Diego Chapter

HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED

- Bacteria
- Metals
- Gross Pollutants (Trash)

CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY

The Collective Watershed Strategy for the San Diego Bay WMA identifies metals and bacteria as high priority water quality problems in the Pueblo Watershed (more specifically Hydrologic Area 908.2). Implementation of this activity will address both high priority water quality problems by identifying the behaviors in the WMA contributing to metals and bacteria loading and testing outreach strategies to determine their effectiveness in reducing loading before broad-scale implementation.

EXPECTED BENEFITS

This CBSM pilot project will address bacteria and metals by researching the behaviors in the San Diego Bay WMA that contribute to their loading. By knowing more precisely the behaviors to target, efforts can be more focused and effective. Piloting outreach efforts will also enable the Copermittees to know which efforts will be most effective in reducing loads before broad-scale implementation.

EFFECTIVENESS MEASUREMENTS

The CBSM pilot project effectiveness in the Chollas Creek area will be measured on a variety of levels. First, the number of stakeholders, residents, and business being reached by the pilot will be tabulated. Second, awareness, attitude and behavioral data will be collected via surveys and observations. Thirdly, once the outreach strategy has been implemented, another survey will be conducted to assess changes in knowledge and/or behavior. Recipients responding to and participating in the survey will also be assessed, such as volunteers, or those who agreed to commit to the project. Finally, tests such as water monitoring will be conducted to asses if any load reductions are achieved.

TITLE: **Outdoor Billboards and Transit Shelters**
ID NUMBER: **XXX**

ACTIVITY DESCRIPTION

The City's Storm Water Pollution Prevention Division has retained a contract with an outdoor advertising company advertise *Think Blue* messages on billboards and bus shelters located in the San Diego Bay WMA. The City intends to create advertisements that target behaviors associated with bacteria and gross pollutants (trash) profiled as a vector. The goal of the billboards is to educate the public about causes of pollution and to encourage positive behavioral change. These advertisements will be developed in FY 2008, and will be displayed throughout the San Diego Bay watershed in both English and Spanish.

TMDL APPLICABILITY

- San Diego Region Beaches and Creeks Bacteria TMDL

TIME SCHEDULE FOR IMPLEMENTATION

The City will coordinate with its Printing Services Division in the design of the advertisements and will work with an outdoor advertising company to have the advertisements created and placed on billboards and transit areas throughout the San Diego Bay WMA in FY 2008 and beyond.

PARTICIPATING WATERSHED COPERMITTEE(S)

- City of San Diego

OTHER PARTICIPATING ENTITIES

- None

HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED

- Bacteria
- Gross Pollutants (Trash)

CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY

The Collective Watershed Strategy for the San Diego Bay WMA identifies bacteria as a high priority water quality problem in the WMA. The outdoor advertisements will result in increased knowledge and awareness regarding bacteria, and trash as a vector, and result in future load reduction of trash and debris directly and of bacteria indirectly.

EXPECTED BENEFITS

The advertisements will address bacteria indirectly by removing a bacterial source: trash. Literature published by the United States Environmental Protection Agency on its website[1] states that debris may be contaminated by pathogens that have adverse effects on humans. By reducing the amount of trash, bacteria loading is reduced.

[1] http://www.epa.gov/owow/oceans/debris/

EFFECTIVENESS MEASUREMENTS

PSA effectiveness will be measured via a Citywide telephone surveys and focus groups comprised of residents in the San Diego Bay WMA to determine awareness, knowledge retention and behavior change.

TITLE: **Mobile Advertising**
ID NUMBER: **XXX**

ACTIVITY DESCRIPTION

The City's Storm Water Division has retained a contract with a mobile advertising firm to advertise *Think Blue* messages on its static billboard trucks in the San Diego Bay WMA. The City intends to create advertisements that target behaviors associated with bacteria and/or metals. The goal of the billboards is to educate the public about causes of these kinds of pollution and to encourage positive behavioral change. These advertisements will be developed in FY 2008, and will be displayed throughout the San Diego Bay WMA in both English and Spanish.

TMDL APPLICABILITY

- None

TIME SCHEDULE FOR IMPLEMENTATION

The City will coordinate with its Print Services department in the design of the advertisements and have the advertisements created and placed on the company's static billboard trucks. The Mobile truck will drive pre-determined routes in the San Diego Bay WMA in an effort to reach targeted, high priority areas within the watershed to increase awareness and promote behavior change.

PARTICIPATING WATERSHED COPERMITTEE(S)

- City of San Diego

OTHER PARTICIPATING ENTITIES

- None

HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED

- Bacteria
- Metals

CONSISTENCY WITH THE WATERSHED STRATEGY

The Collective Watershed Strategy identifies bacteria and metals as high priority water quality problems in the San Diego Bay WMA and recommends implementing load reduction/source abatement activities to address it. Utilizing the Mobile static billboard truck will result in increased knowledge and awareness directly, and will promote behavior change.

EXPECTED BENEFITS

The mobile advertisements will address bacteria and/or metals to increase knowledge awareness and promote behavior change.

EFFECTIVENESS MEASUREMENTS

Mobile advertisement effectiveness will be measured via a Citywide telephone surveys and focus groups comprised of residents in the San Diego Bay WMA.